REMARKS

Claims 17, 36-37, and 58-80 were rejected. Claims 17, 36, 58-61, 64-68, and 78-80 have been amended, while claims 37, 62-63, and 69-75 have been cancelled without prejudice. New claims 81-85 have been added. Thus, claims 17, 36, 58-61, 64-68, and 76-85 are pending.

Claims 17, 36, 58-60, and 64-66 have been amended to recite a sequence having at least 95% sequence identity to a complement of the coding sequence of SEQ ID NO:1. Support for these amendments can be found in the specification at, for example, page 13, lines 24-32, page 18, lines 9-15, page 20, lines 12-30, page 34, lines 17-26, and Figure 10.

Claims 17 and 36 have been further amended to replace the phrase "and segments thereof" with "or of a segment of said coding sequence," as the Examiner suggested in the telephone interview of January 16, 2007. Claims 17 and 36 also have been amended to replace "host cell" with "plant cell." Claims 17 and 36 further have been amended to replace "DWF4" with "CYP90B." Support for these amendments can be found in the specification at, for example, page 37, line 29, to page 41, line 18, page 11, line 30 to page 12, line 1, page 54, lines 21-25, Figure 3, and Figure 4.

Claim 36 has also been amended to recite that the altered phenotype is selected from the group consisting of reduced cell length, reduced hypocotyl length, reduced height at maturity, and darker green leaves. Support for this amendment and new claims 82-85 can be found in the specification at, for example, page 56, lines 17-28, page 57, line 21 to page 58, line 17, page 60, lines 28-29, page 63, lines 31-32, Table 1, and Table 2.

Claims 58-60 and 64-66 have been amended to remove the phrase "having at least 85% sequence identity to a complement of SEQ ID NO:1" to more particularly point out the claimed subject matter.

Claims 61 and 67 have been amended to recite a sequence having at least 98% sequence identity to a complement of the coding sequence of SEQ ID NO:1. Support for these amendments can be found in the specification at, for example, page 18, lines 9-15.

Claim 68 has been amended to recite a polynucleotide comprising a sequence having 100% identity to the complement of the coding sequence of SEQ ID NO:1 or of a fragment of

the coding sequence. Support for this amendment and new claim 81 can be found in the specification at, for example, page 33, lines 1-4.

Claims 78-80 have been amended to correct dependency.

Thus, no new matter has been added.

In light of these amendments and the following remarks, Applicants respectfully request reconsideration and allowance of claims 17, 36, 58-61, 64-68, and 76-85.

Interview Summary

Applicants thank the Examiner for the courtesy of the telephone interview of January 16, 2007, in which the rejections under 35 U.S.C. §§ 112 and 103 were discussed.

Rejections under 35 U.S.C. § 112, second paragraph

The Examiner rejected claims 17, 36, 37, and 58-80 under 35 U.S.C. § 112, second paragraph, as being indefinite. Specifically, the Examiner stated that claims 17, 36, and 37 are indefinite because the recitation, "isolated polynucleotide comprises a sequence having at least 85% sequence identity to a complement of SEQ ID NO:1 and segments thereof" is unclear. The Examiner also stated that claim 37 is indefinite because it is unclear what is meant by "overexpressed."

Claims 17 and 36 have been amended to recite "or segments of said coding sequence," as the Examiner suggested, while claim 37 has been cancelled. In light of these amendments, Applicants respectfully submit that claims 17, 36, and 58-80 as amended are sufficiently definite.

The Examiner rejected claims 78-80 for insufficient antecedent basis. Claims 78-80 have been amended to correct dependency. Applicants respectfully submit that amended claims 78-80 have proper antecedent basis.

In light of the above, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 112, second paragraph.

Rejections under 35 U.S.C. § 112, first paragraph, written description

The Examiner rejected claims 17, 36, 37, and 58-80 under 35 U.S.C. § 112, first paragraph, as lacking written description. Particularly, the Examiner stated that the specification does not teach any isolated polynucleotide having a sequence that is at least 85% identical to any sequence that is complementary to any subsequence of SEQ ID NO:1, or segments thereof. The Examiner further stated that the specification does not describe the structure of any non-coding sequence of SEQ ID NO:1 that is capable of inhibiting DWF4 polypeptide expression when expressed in antisense orientation.

Applicants respectfully disagree. To further prosecution, however, the claims have been amended to recite an isolated polynucleotide having a sequence that has at least 95% identity to a complement of the coding sequence of SEQ ID NO:1 or segments of the coding sequence. The specification adequately describes the claimed methods. For example, Figure 10 and page 13, lines 24-32, of the specification provide the coding sequence of SEQ ID NO:1. On page 33, lines 3-4, the specification states, "...a nucleic acid segment from the desired gene is cloned and operably linked to a promoter such that the antisense strand of RNA will be transcribed." With regards to percent identity, the specification states that, "...more than about 80% is preferred, though about 95% to absolute identity would be most preferred," and, "[g]enerally, higher homology can be used to compensate for the use of a shorter sequence." See, page 34, lines 25-26, and page 33, lines 18-19, respectively. Further, the specification describes various lengths of the polynucleotide on page 33, lines 21-26. Thus, Applicants respectfully submit that the specification provides adequate written description for claims 17, 36, 58-61, 64-68, and 76-80.

The Examiner rejected claim 37 under 35 U.S.C. § 112, first paragraph, as containing new matter. Claim 37 has been cancelled, thereby rendering this rejection moot.

In light of the above, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 112, first paragraph, for lack of written description.

Rejections under 35 U.S.C. § 112, first paragraph, enablement

The Examiner rejected claims 17, 36, 37, and 58-80 under 35 U.S.C. § 112, first paragraph, as lacking enablement. Specifically, the Examiner stated that, "the specification, while being enabling for the claimed methods wherein the isolated polynucleotide comprises a

sequence that is a complement of the coding segments of SEQ ID NO:1, does not reasonably provide enablement for the claimed method wherein the isolated polynucleotide comprises a sequence having at least 85% identity to a complement of SEQ ID NO:1, or segments thereof that are non-coding sequences, or only portions of the coding sequence."

Applicants respectfully traverse.

The test for enablement is whether one skilled in the art as of the effective filing date could make and use the claimed invention from the disclosures in the specification coupled with the information known in the art without undue experimentation. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). Factual considerations that can be weighed when determining whether undue experimentation would be required include: (1) the breadth of the claims, (2) the nature of the invention, (3) the state of the prior art, (4) the relative skill of those in the art, (5) the predictability or unpredictability of the art, (6) the amount of direction or guidance provided, (7) the presence or absence of working examples, and (8) the quantity of experimentation necessary. See, *In re Wands*, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). All the evidence must be considered, and any conclusion of nonenablement must be based on the evidence as a whole. MPEP § 2164.01(a).

The specification fully enables the presently pending claims. Claims 17 and 36 as amended recite a sequence having at least 95% identity to a complement of the coding sequence of SEQ ID NO:1 or segments of said coding sequence. Thus, the claims are not broadly drawn. Further, the specification provides detailed guidance on how to make and use CYP90B polynucleotides and segments thereof to inhibit gene expression. For example, the specification at page 28, line 25, to page 30, line 19, and Example 2 provides guidance on isolating and synthesizing CYP90B polynucleotides. The specification at page 32, line 22 to page 35, line 5, provides guidance on using polynucleotides to inhibit gene expression. The specification at page 36, line 5, to page 41, line 18, provides guidance on making recombinant vectors and transforming plants. The specification further states that "...expression cassettes of the invention can be used to suppress (underexpress) endogenous *dwf4* gene expression." See page 32, lines 23-25, of the specification. Finally, Applicants submit herewith a Declaration under 37 C.F.R. § 1.132 of Roger I. Pennell. The attached Declaration of Dr. Pennell reports the results of

experiments with a full length and two partial antisense segments of the coding sequence of a CYP90B. The results of these experiments support a conclusion that the use of segments of the coding sequence of a CYP90B result in reduced CYP90B mRNA. See paragraph 14 of the Pennell Declaration. The results of the experiments reported in the Pennell Declaration also show that use of the antisense segments referred to above results in an altered phenotype comprising reduced hypocotyl length, reduced height at maturity, and darker green leaves as compared to control plants. See paragraphs 21-23 and Figure 2 of the Pennell Declaration. The results of these experiments support a conclusion that the use of segments of the coding sequence of a CYP90B result in an altered phenotype comprising reduced cell length, reduced hypocotyl length, reduced height at maturity, and darker green leaves. In light of the scope of the claims, the guidance provided in the specification, and the results of the experiments reported in the Pennell Declaration, claims 17, 36, 58-61, 64-68, and 76-80 are fully enabled by the specification.

In light of the above, Applicants respectfully request withdrawal of the rejection of claims 17, 36, 58-61, 64-68, and 76-80 under 35 U.S.C. § 112, first paragraph, for lack of enablement.

Rejections under 35 U.S.C. § 103(a)

The Examiner rejected claims 17, 36, and 58-80 under 35 U.S.C. § 103(a) as being unpatentable over Choe et al. ((1998) *Plant Cell*, 10:231-44). The Examiner also rejected claim 37 under 35 U.S.C. § 103(a) as being unpatentable over Choe et al. ((1998) *Plant Cell*, 10:231-44) in combination with Purcell et al. ((1998) *Plant Journal*, 14:195-202) and van der Meer et al. ((1990) *Plant Molecular Biology*, 15:95-109). Attached hereto are Declarations under 37 C.F.R. § 1.132 of Ricardo Azpiroz, Sunghwa Choe, and Kenneth A. Feldmann. As stated in the attached Declarations, Ricardo Azpiroz, Sunghwa Choe, and Kenneth A. Feldmann are joint inventors of the presently claimed invention, while Brian P. Dilkes, Shozo Fujioka, Suguru Takastuto, and Akira Sakurai did not conceive the presently claimed subject matter. In light of the Declarations under 37 C.F.R. § 1.132, and the cancellation of claim 37, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103(a).

CONCLUSION

Applicants respectfully submit that claims 17, 36, 58-61, 64-68, and 76-85 are in condition for allowance, which action is requested. The Examiner is invited to call the undersigned attorney at the telephone number below if such will advance prosecution of this application. Enclosed is a $60.00 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: Feb 2, 2007

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

AZPIROZ et al.

Serial No.: 09/502,426 Group Art Unit: 1638

Filing Date: February 11, 2000 Examiner: A. Mehta

Title: *dwf4* POLYNUCLEOTIDES, POLYPEPTIDES AND USES THEREOF

DECLARATION OF INVENTORS

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

We, Ricardo AZPIROZ, Sunghwa CHOE and Kenneth A. FELDMANN, hereby declare as follows:

1. We are coinventors of the subject matter disclosed and claimed in the above-referenced patent application, U.S. Serial No. 09/502,426, filed February 11, 2000, claiming the benefit of U.S. Provisional Applications Serial Nos. 60/119,657 and 60/119,658, both filed on February 11, 1999. CHOE and FELDMANN are also coauthors on Choe *et al.* (1998) "The DWF4 Gene of Arabidopsis Encodes a Cytochrome P450 that Mediates Multiple 22α-Hygroxylation Steps in Brassinosteroid Biosynthesis" Plant Cell **10**: 231-244. ("Choe *et al.*").

2. The portions of Choe *et al.* relevant to the present invention originated from the coinventors herein. The noninventor coauthors on Choe *et al.*, Brian P. DILKES, Shozo FUJIOKA, Suguru TAKATSUTO, and Akira SAKURAI, did not conceive of the subject matter claimed in the above-identified patent application and are not coinventors thereof.

3. We declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date 6/5/02

Ricardo Azpiroz.

Ricardo AZPIROZ

Date _____

_____

Sunghwa CHOE

Date _____

_____

Kenneth A. FELDMANN

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3. We declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date _____

Ricardo AZPIROZ

Date 5/15/2002

Sunghwa CHOE

Date _____

Kenneth A. FELDMAN

Atty Dkt 2225-0001
94004.003
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Date _____

_____
Ricardo AZPIROZ

Date _____

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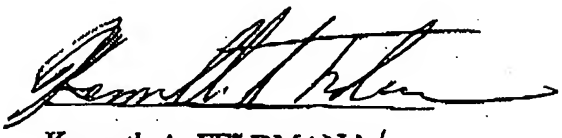
Sunghwa CHOE

Date 5-23-02



Kenneth A. FELDMAN